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## PATENT SPECIFICATION

1.147.915



DRAWINGS ATTACHED

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### COMPLETE SPECIFICATION

#### Rotary Abrasive Device

We, MERIT PRODUCTS INC, a Corporation organised under the laws of the State of California, United States of America, of 5515, West 104th Street, Los Angeles, California 90045, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a rotary abrasive device comprising a cylindrical housing supporting a plurality of radially extending brushes adjacent respective longitudinal slots through which abrasive ribbons extend, the inner ends of the ribbons being attached to a polygonal reel sleeve which fits over a core, the core being rotatably adjustable with respect to the housing to adjust the length of ribbon protruding from each slot. Such a device will hereinafter be referred to "as of the type specified".

One of the major advantages of such a rotary abrasive device is that the reel sleeve with the abrasive ribbons attached thereto is a replaceable unit which may be readily discarded and replaced when the ribbons are worn out. Therefore, the disposal abrasive unit must be relatively simple in construction so that it is not expensive to replace. In a known rotary abrasive device an octagonal reel sleeve fits on an octagonal core. The use of such a combination has resulted in difficulties, since it does not completely eliminate slippage between the reel sleeve and the core. Especially with the smaller size rotary abrasives devices, the octagonal shape approximates a cylinder so that the torque exerted by the abrasive ribbons causes slippage between the reel and the control core. In addition, the abrasive ribbons are commonly attached to the reel sleeve using staples. These staples project inwardly against the core and do not allow for a snug fit between the core and the reel sleeve. This tends

to force the reel sleeve into a circular configuration, increasing the tendency for slippage to take place between the control core and the reel sleeve.

The present invention eliminates these difficulties by providing a device of the type specified wherein the core has a plurality of lugs extending radially therefrom into the corners of the polygonal sleeve. The fastening means for the abrasive ribbons, such as staples, can be accommodated within the recesses formed between the lugs. In this manner, the fastening means do not force the reel sleeve into a circular configuration, since the fastening means are retained within the recesses. Also, the lugs tend to retain the shape of the reel sleeve, since the lug members reinforce the corners of the reel sleeve. In addition, the lug members have a tendency to dig into the corners, thereby providing for a better locking of the reel sleeve on the core during rotation of the rotary abrasive.

In a preferred embodiment of the invention, the core has four equally-spaced lugs and the reel sleeve is square. The abrasive ribbons are fastened by stapling to the flat sides of the reel sleeve and, in particular, two abrasive ribbons are stapled to each one of the four flat sides. Therefore, each flat side holds the abrasive ribbons for two of the circumferential slots in the outer rotary housing. Since the fastening means are accommodated within the recessed area between the lugs, it is possible to use relatively heavy staples to fix the abrasive ribbons securely to the reel sleeve.

The present invention, therefore, eliminates the short-comings of the known rotary abrasive device without increasing the cost of the device, since the changes in structure are relatively simple. A clearer understanding of the present invention will be had with reference to the following description and accompanying drawings of a particular embodiment of the invention, wherein:

Figure 1 is a perspective exploded view of the embodiment of the rotary abrasive device of the present invention;

5 Figure 2 is a top view of the rotary abrasive device of Figure, showing portions broken away; and

Figure 3 is a side view of the rotary abrasive device of Figure 1.

10 The device includes a rotary drum or housing having a cylindrical wall 10 which is closed at one end by an end wall 12. A reel sleeve 14 is positioned centrally within the housing. Attached to the reel sleeve 14 are a plurality of abrasive ribbons made of a material such as emery paper, sandpaper or the like, and having their inner ends anchored to the reel sleeve through the use of fastening means such as staples 18. Two such abrasive ribbons 16 are fastened to each face of the reel sleeve 14. As illustrated in Figure 2, the abrasive ribbons are wound on the reel sleeve with their outer ends extending through a plurality of longitudinal slots 20 located circumferentially around the cylindrical wall 10. A corresponding plurality of brushes 22 extend radially from the cylindrical wall 10 and the brushes 22 back up the exposed outer ends of the abrasive ribbons 16 during rotary movement of the abrasive device.

30 A core 24 is designed to be received within the reel sleeve 14. The core includes a plurality of lugs 26 extending radially from the control core. The lugs 26 fit within the corners formed by the adjacent sides of the reel sleeve 16 so as to lock the reel sleeve 14 on the core 24. The core 24 controls the rotary position of the reel sleeve in a manner to be explained.

40 A disk 28 having a knurled peripheral edge closes the open end of the rotary housing. A spindle 30, having a threaded end 32, is mounted within the housing and extends through the reel sleeve 14 and core 24 to a position outside the disk. A knurled nut 34 engages the threaded end 32 to lock the disk 28 in position. The disk 28 supports the core 24 within the rotary housing.

45 The rotary housing is formed with a hub 36 to permit the rotary abrasive device to be mounted on the end of a drive shaft (not shown) and to be secured to the drive shaft through the use of a pair of set screws 38 which fit within threaded openings 40 in the hub 36.

50 The cylindrical wall 10 supports longitudinal channels 42 mounted inside the cylindrical wall. The channels 42 are used to mount the brushes 22, and include entrance slots 44. Each of the brushes 22 is composed of a plurality of bristles 46 bonded to a base member 48. The base member is slid into the channel 42 and the bristles 46 protrude through the slot 44. A spring member 50 may be slid in the channel 42 against the base 48 to lock the brush in position.

65 The reel sleeve 14 has a square cross-section and may be composed of cardboard or other suitable material. The square reel sleeve 14 has four flat sides, each receiving a pair of abrasive ribbons 16 as indicated above. When the reel sleeve 16 is slid over the core 24, the lugs 26 fit into the corners of the reel sleeve 14. In between each pair of lugs 26 is formed a recess 52. The staples 18 fit within these recesses 52 without engagement against the core 24.

70 After a portion of the abrasive ribbon 16 is worn out, it is necessary to feed out additional abrasive material from the interior of the rotary abrasive device. The feeding out of the additional abrasive material is indexed using index means including a plurality of projections 54 which extend from the wall 12 and which projections 54 include a corresponding plurality of index recesses 56. End portions 58 of the lugs cooperate with the recesses 56 so as to fit within the recesses 56. Therefore, the core 24 may be indexed to feed out additional material by loosening the nut 34 to release the core and then rotate the disk 28 and core 24 so that the end portion 58 is indexed to fit within a new one of the recesses 56.

90 In the use of the rotary abrasive device, a reel sleeve 14 containing abrasive ribbons 16 is slipped over the core 24 and the outer ends of the ribbons are brought out through the slots 20. The nut 34 is then screwed down to position the cover disk 28 over the open end of the rotary abrasive device. The nut, however, is not completely tightened, so the core 24 does not have its outer ends 58 engaging the recesses 26. The cover 28 may, therefore, be rotated in a clockwise direction so as to wind the strips into the interior of the rotary housing; however, leaving a sufficient amount of material extending from the slots 20. The nut 34 may now be completely tightened, making sure that the ends 58 fit within recesses 56. When the abrasive material is worn out, new material may be fed out by loosening the nut 34 and rotating the cover 26 for one or two index positions, and then tightening up the nut 34. During operation of the rotary abrasive device, the additional abrasive material will be fed out automatically upon the rotation of the wheel.

#### WHAT WE CLAIM IS:—

1. A rotary abrasive device of the type specified, wherein the core has a plurality of lugs extending radially therefrom into the corners of the polygonal sleeve. 120
2. A device according to claim 1, wherein fastening means which attach the ribbons to the sleeve are accommodated within the recesses formed between the lugs.
3. A device according to claim 1 or 2, wherein there are four lugs, the reel sleeve being square. 125
4. A device according to any of claims 1

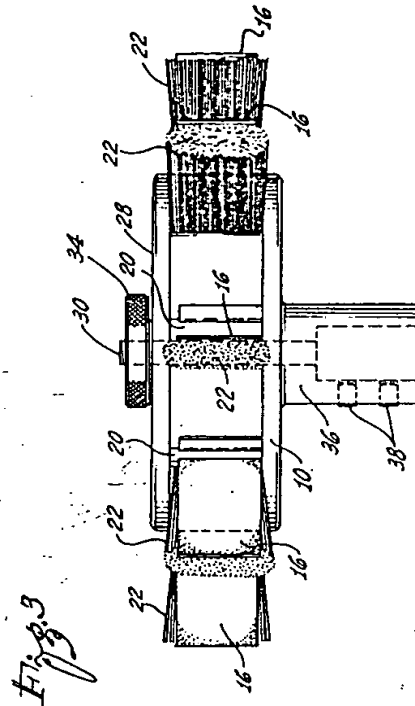
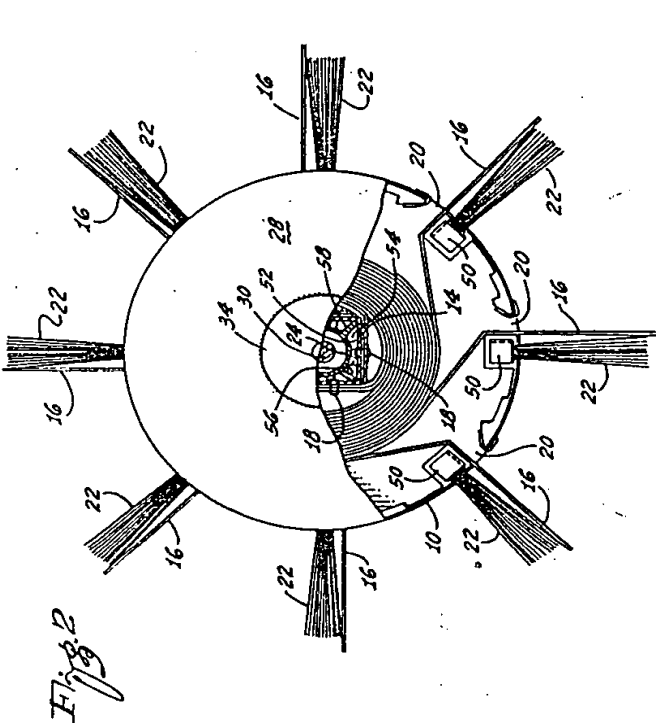
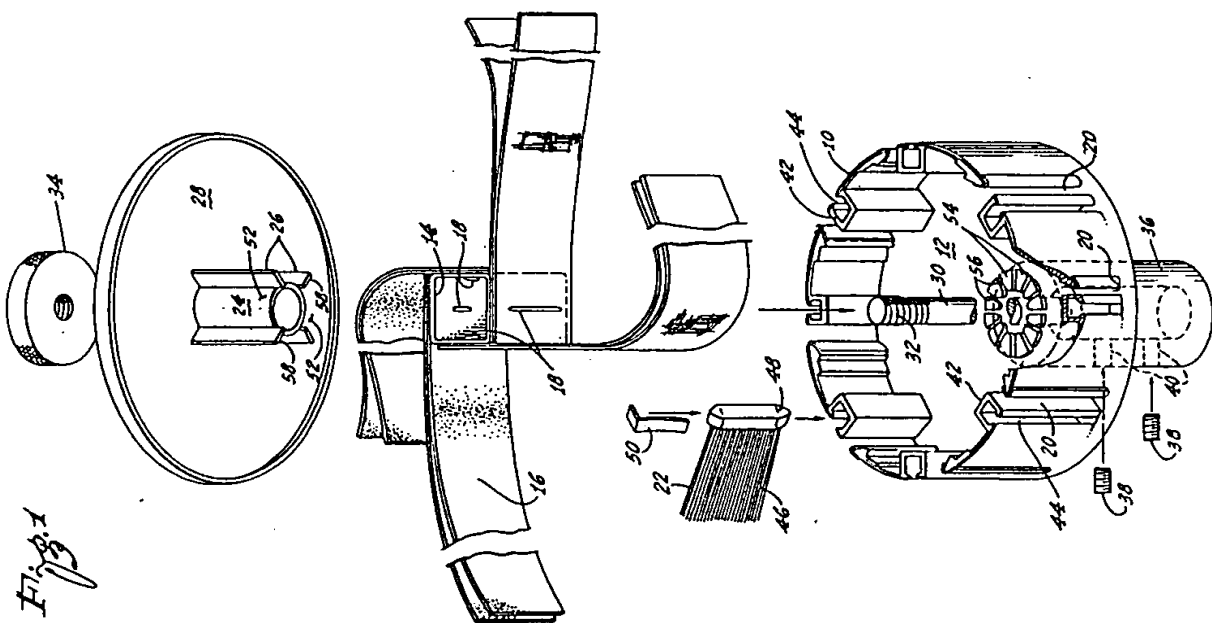
to 3, wherein there are more slots and ribbons than the polygonal sleeve has sides, a plurality of ribbons being attached to each side.

5. A rotary abrasive device of the type specified substantially as described with reference to and as shown in the accompanying drawings.

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